

EXERCISES – Composite & Piecemeal Functions

1. Given that $f(x) = x+2$ and $g(t) = t^2 + t$

Find: (a) $f(g(t)) =$

and (b) $g(f(x)) =$

2. Given that $h(w) = \frac{1}{w+1}$ and $f(u) = u^2 - 1$

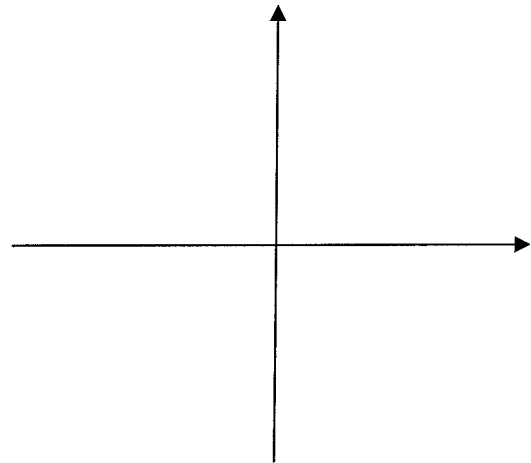
Find: (a) $f(h(w)) =$

and (b) $h(f(u)) =$

3. Given that: $f(x) = \begin{cases} 6-x & ; \text{for } x \geq 2 \\ x^2 & ; \text{for } 0 < x < 2 \\ x+4 & ; \text{for } x \leq 0 \end{cases}$

(a) Evaluate: $f(0) - f(1) + 5f(3) =$

(b) Sketch the graph of: $y = f(x)$



4. Find the inverse function $f^{-1}(x)$ if:

(a) $f(x) = 2x - 5$

(b) $f(x) = \frac{4}{\sqrt{x}-1}$

(c) $f(x) = \frac{1+2x}{x}$



5. Given that $f(x) = \frac{4}{x^2-1}$; and $g(x) = \sqrt{4-x^2}$

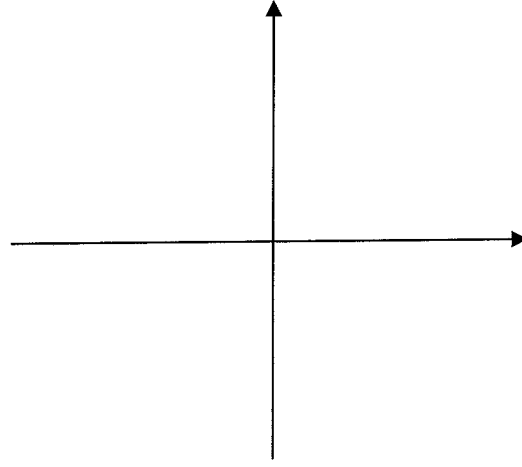
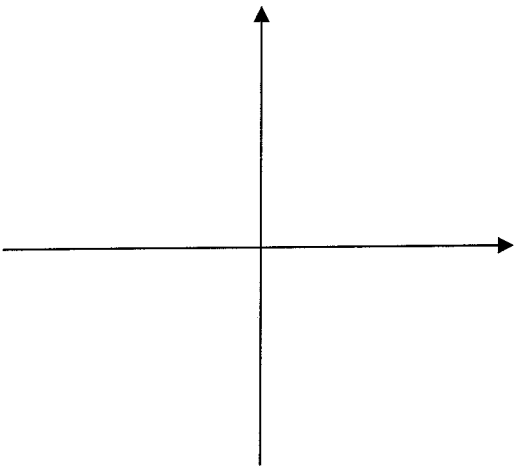
What is the natural Domain of (a) $f(x)$ and

(b) $g(x)$

6. Sketch the graphs of:

(a) $y = |2x - 3|$

(b) $y = |x + 2| - 3$

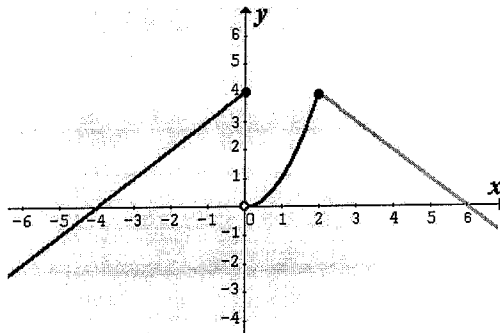


ANSWERS:

1. (a) $t^2 + t + 2$ (b) $x^2 + 5x + 6$

2. (a) $\frac{1}{(w+1)^2} - 1$ or $\frac{-w(w+2)}{(w+1)^2}$ (b) $\frac{1}{u^2}$

3. (a) $4 - 1 + 15 = 18$ (b)

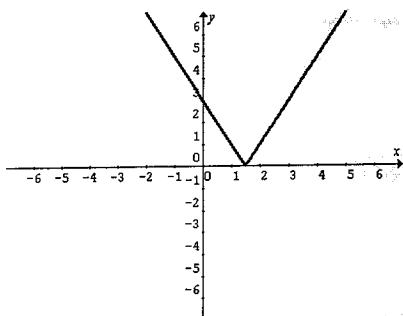


4. (a) $f^{-1}(x) = \frac{x+5}{2}$ (b) $f^{-1}(x) = \frac{16}{x^2} + 1$ ($x > 1$) (c) $f^{-1}(x) = \frac{1}{x-2}$

5. (a) $D = \{x \in \mathbb{R} : x \neq 1 \text{ and } x \neq -1\}$

(b) $D = \{x \in \mathbb{R} : -2 < x < 2\}$

6. (a)



(b)

